



# UNITED STATES PATENT AND TRADEMARK OFFICE

*cy*

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,830	06/23/2003	Chin-I Lin	Q76164	6942
23373 7590 01/12/2007 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			EXAMINER YANG, NELSON C	
			ART UNIT 1641	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			01/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/600,830

Applicant(s)

LIN ET AL.

Examiner

Nelson Yang

Art Unit

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-16 and 18-34 is/are pending in the application.
- 4a) Of the above claim(s) 2-5, 10-13, 15 and 18-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 7-9, 14 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's cancellation of claims 6, 17 is acknowledged and has been entered.
2. Applicant's amendment of claims 1, 7, 8 is acknowledged and has been entered.
3. Claims 1, 7-9, 14, 16, 17 are currently under examination.
4. Claims 2-5, 10-13, 15, 18-34 have been withdrawn.

### ***Rejections Withdrawn***

5. Applicant's arguments, see p. 10, filed October 17, 2006, with respect to the rejection of claims 1, 6-9, 14, 16, 17 are rejected under 35 U.S.C. 112, second paragraph, have been fully considered and are persuasive. The rejection of claims 1, 6-9, 14, 16, 17 under 35 U.S.C. 112, second paragraph, has been withdrawn.
6. Applicant's arguments, see p. 11-12, filed October 17, 2006, with respect to the rejection of claim 1 under 35 U.S.C. 102 have been fully considered and are persuasive. The rejection of claim 1 under 35 U.S.C. 102 (a) and (b) has been withdrawn.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1641

8. Claims 1, 9, 14, 16 are rejected under 35 U.S.C. 103(a) as obvious over Vossmeier [US 6,458,327] in view of Perez et al. [Perez et al., Molecularly imprinted nanoparticles prepared by core-shell emulsion polymerization, 2000, J App Poly Sc; 77, 1851-1859].

With respect to claim 1, Vossmeier teaches nanoparticle structures that define cavities tailored to the size of analyte to be detected (column 5, lines 20-40), where the nanoparticles structures comprised functionalized nanoparticles (plurality of nanoparticles) linked together by polyfunctionalized polymers (polymerization) (column 4, lines 60-65). Vossmeier teaches that the nanoparticles may be made of semiconductors (column 5, lines 45-50). Vossmeier fail to teach that the cavities are formed by molecularly imprinting with a template molecule that is subsequently removed.

Perez et al., however, teach that nanoparticle polymers prepared by molecular imprinting provide a means of creating specific recognition and catalytic sites similar to those found in biological systems (p.1851, col.1). The polymerization of the nanoparticles is performed with the addition of styrene (functional monomer), EGDMA (crosslinking agent), and CVPC (initiator) (p.1854, fig.1, col.1). Perez et al. further emphasize that with smaller imprinted nanoparticles, one is able to exercise much better control over the particle size, and to narrow significantly the size distribution (p.1851, col.2). Perez et al. teach that the molecular imprinting is accomplished by adding template molecules to seed particles between 30 and 45 nm and allowing polymerization to proceed (p. 1854, cols. 1-2). The template molecules are then removed, revealing imprinted core shell polymers (p. 1855, col.1, fig. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to bind nanoparticles to a template molecule for molecular imprinting, followed by

Art Unit: 1641

removing the template molecule, in order to create specific recognition and catalytic sites similar to those found in biological systems, while using nanoparticles that are able to provide exercise much better control over the particle size, and to narrow significantly the size distribution. Since the method of Vossmeier is directed toward defining cavities into which analyte molecules can diffuse, one would have been motivated to make the cavities based on molecular imprinting, as shown by Perez et al., to allow for more specific binding and accurate detection.

9. With respect to claim 9, Vossmeier teaches that the nanoparticles are functionalized (column 4, lines 51-65).

10. With respect to claim 14, 16, Vossmeier teaches that the nanoparticles may be functionalized by 3-aminopropyltriethoxysilane or by mercaptoalkylsilanes (column 4, lines 55-60).

11. Claims 7-8 are rejected under 35 U.S.C. 103(a) as obvious over Vossmeier [US 6,458,327] in view of Perez et al. [Perez et al., Molecularly imprinted nanoparticles prepared by core-shell emulsion polymerization, 2000, J App Poly Sc, 77, 1851-1859], and further in view of Peng et al. [Peng et al., Epitaxial growth of highly luminescent CdSe/CdS Core/Shell nanocrystals with photostability and electronic accessibility, 1997, J Am Chem Soc, 119, 7019-7029].

With respect to claim 7, 8, Vossmeier teaches semiconductor nanoparticles, as discussed above. Vossmeier does not specify that the semiconductor is a II-VI or III-V semiconductor, nor that the nanoparticles have a core-shell structure of at least two semiconductors.

Peng et al., however, teach CdSe/CdS core/shell nanocrystals (p.7020, col.1). Peng et al. further teach that the nanocrystals are extremely stable with respect to photooxidation, with electrons that are fully delocalized (p.7020, col.1), and electronic accessibility (p. 7029, col.2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for the semiconductor nanoparticles of Vossmeier to be CdSe/CdS core/shell nanocrystals, as suggested by Peng et al., in order to obtain nanoparticles that are extremely stable with respect to photooxidation, with electrons that are fully delocalized and electronic accessibility.

#### ***Response to Arguments***

12. Applicant's arguments filed October 17, 2006 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, While the Office acknowledges applicant's arguments that Vossmeier fails to teach that the cavities are formed by molecularly imprinting with a template molecule that is subsequently removed, Perez et al. do teach this step, and does provide motivation for doing so. Perez et al. teach that nanoparticle polymers prepared by molecular imprinting provide a means of creating specific recognition and catalytic sites similar to those found in biological systems

Art Unit: 1641

(p.1851, col.1). Perez et al. further emphasize that with smaller imprinted nanoparticles, one is able to exercise much better control over the particle size, and to narrow significantly the size distribution (p.1851, col.2). This would allow for more specific binding and more accurate detection.

13. For these reasons, applicant's arguments are not found persuasive.

### ***Conclusion***

14. No claims are allowed.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson Yang whose telephone number is (571) 272-0826. The examiner can normally be reached on 8:30-5:00.

Art Unit: 1641

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nelson Yang  
Patent Examiner  
Art Unit 1641

  
LONG V. LE 01/07/07  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1600